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**Comments of ITM Power Inc. on the
2015-17 Electric Program Investment Charge (EPIC) Program
Second Triennial Investment Plan
Docket No. 12-EPIC-01
Submitted to the California Energy Commission
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Via email: docket@energy.ca.gov**

California Energy Commission

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ITM Power manufactures and sells a range of compact, highly responsive hydrogen generators that utilize water electrolysis to provide pure hydrogen on demand. ITM Power-U.S. was incorporated in California in 2013 and has offices in Irvine.

ITM-US appreciates the opportunity to comment on the California Energy Commission's Draft 2015-2017 EPIC Investment Plan. We believe CEC should include Hydrogen Energy Storage (HES) in its plan and support one or more commercial validation demonstrations of electrolyzer based HES.

Hydrogen produced by electrolysis is ideal for energy storage. Load following electrolyzers are able to

- dynamically load follow wind or solar power generation, helping smooth out small instantaneous variations in generation,
- provide demand for renewable generation that might otherwise go unharvested,
- link the electric grid with the natural gas grid via pipeline injection, providing virtually limitless carbon free energy storage,
- support carbon sequestration via chemical and bio-methanation,
- replace carbon based fuels in the transportation system via fuel cell electric vehicles, and
- provide an unmatched option for seasonal energy storage in large quantities.

CEC recognizes the importance of energy storage in its 2013 annual report (pp. 30-23), and in its 2015-2017 Plan (pp. 104-108). As the Annual Report eloquently states:

"In California's low-carbon, flexible-grid future, energy storage will be used for multiple purposes. Energy storage technologies can help store energy in periods of low demand and high production, and they can regulate the output power of renewable generation sources so they are more easily integrated into the overall grid. Using energy storage to smooth renewable output also prevents GHG emissions

from conventional fossil fuel generators that have predominantly been used for this purpose because storage and battery technologies were not advanced enough.”

CEC has financed about 20 storage projects, but none involved hydrogen, nor is hydrogen mentioned among the long list of storage options in the discussion of Strategic Objective S 15 in the draft plan. We urge CEC to correct this oversight.

- Demonstration of hydrogen energy storage will support the California Public Utilities Commission’s directive to California utilities to install 1,325 MW of energy storage by no later than 2024.
- Demonstration of hydrogen energy storage will support the goals of the Low Carbon Fuel Standard by demonstrating a technology capable of reducing the carbon intensity of the natural gas grid via direct injection of hydrogen
- Demonstration of hydrogen energy storage will support California’s greenhouse gas reduction program by providing an option for CO2 sequestration that does not require movement of massive amounts of CO2 or bulk CO2 storage.
- Demonstration of hydrogen energy storage supports the State’s Zero Emission Vehicle goals by providing 100% renewable hydrogen for fuel cell electric vehicles.
- Demonstration of hydrogen energy storage supports California’s drive to renewable power generation by supporting the operation of renewables on the grid and will improve overall economics by providing a source of demand whenever renewable power is available.

In Europe, where the percentage of renewable generation on the utility grid is much greater than it is in the U.S., dozens of hydrogen energy storage and “power to gas” projects are under way. A map of operating or planned power-to-gas projects in Europe may be found at: <http://www.northseapowertogas.com/demonstrations>. California can take advantage of Europe’s experience to take the U.S. lead in hydrogen energy storage.

We also call the attention of the Commission to a recent analysis by the SBC Energy Institute on hydrogen based energy conversion.

<http://www.sbc.slb.com/SBCInstitute/Publications/Hydrogen.aspx>

ITM Power Inc. is a member of the California Hydrogen Business Council and supports the comments of CHBC.

ITM Power Inc. is happy to provide additional information and assistance to the commission on hydrogen and hydrogen storage.

Thank you for the opportunity to comment on this very important matter.

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